2E2002

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B.Tech. (Sem.II) (Main/Back) Examination - 2014

202 Engineering Mathematics - II

[Time : 3 Hours] [Total Marks : 80]

[Min. Passing Marks : 24]

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1. **(a)** Find the equation of sphere having the circle $x^2 + y^2 + z^2 = 9, x - 2y + 2z = 5$ as a great circle. **(8)**

   (b) Find the equation to the right circular cone with vertex at the origin, axis the line $\frac{x}{2} = \frac{y}{-4} = \frac{z}{3}$ and which passes through the point (1, 1, 2). **(8)**

OR

1. **(a)** Obtain the equation of the sphere which passes through the four points (4, –1, 2), (0, –2,3), (1, 5, –1), (2, 0, 1). **(8)**

   (b) Find the equation of right circular cylinder whose axis is $x = 2y = -z$ and radius is 4. **(8)**

Unit - II

2. **(a)** Examine for consistency the following equation and solve them if they are consistent.

   $x + y + z = 6$; $2x + y + 3z = 13$;

   $5x + 2y + z = 12$; $2x - 3y - 2z = -10$ **(8)**

   (b) Find the eigen values and eigen vectors of the following matrix A :

$$A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$ **(8)**

(b) 8 pole lap wound armature has 40 slots with 12 conductor per slots, generate a voltage of 500 V. Determ the speed at which it is running if flux per pole is 50 wb.

OR

3. (a) Explain the principle and working of 3-phase induction motor and explain type of 3-phase induction motor.

(b) Describe the principle of operation of 3-phase synchronous generator.

UNIT - IV

4. (a) Define α and β of a transistor. Derive the relationship between them.

(b) Write short note on P-N junction diode and Zener diode.

OR

4. (a) Describe the action of the following filter circuit

(i) Shunt capacitor filter

(ii) Series inductor filter

(iii) Choke input LC filter

(b) Explain different type of logic gates and design their truth tables.

UNIT - V

5. (a) What do you mean by modulation? Discuss the amplitude modulation in details.

(b) Discuss the configuration and properties of satellite communication.

OR

5. (a) What is transducers? Discuss the classification of transducers with example.

(b) Discuss the various types of IC's.